

TRAINING SUPPORT PACKAGE (TSP)

TSP Number / Title	T225 / OPERATE THE MULTIPLE INTEGRATED LASER ENGAGEMENT SYSTEM (MILES)
Effective Date	01 Oct 2003
Supersedes TSP(s) / Lesson(s)	M204, Introduction to Multiple Integrated Laser Engagement System (MILES), September 1999.
TSP Users	400-PLDC PH II, Primary Leadership Development Course, Phase II 400-PLDC Primary Leadership Development Course
Proponent	The proponent for this document is the Sergeants Major Academy.
Improvement Comments	<p>Users are invited to send comments and suggested improvements on DA Form 2028, <i>Recommended Changes to Publications and Blank Forms</i>. Completed forms, or equivalent response, will be mailed or attached to electronic e-mail and transmitted to:</p> <p>COMDT USASMA ATTN ATSS D BLDG 11291 BIGGS FIELD FORT BLISS TX 79918-8002</p> <p>Telephone (Comm) (915) 568-8875 Telephone (DSN) 978-8875 E-mail: atss-dcd@bliss.army.mil</p>
Security Clearance / Access	Unclassified
Foreign Disclosure Restrictions	FD5. This product/publication has been reviewed by the product developers in coordination with the USASMA foreign disclosure authority. This product is releasable to students from all requesting foreign countries without restrictions.

PREFACE

Purpose

This Training Support Package provides the instructor with a standardized lesson plan for presenting instruction for:

Task Number

Task Title

071-990-0010

Conduct Preparatory Marksmanship Training.

This TSP
Contains

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Operate the Multiple Integrated Laser Engagement System (MILES)
T225 / Version 1
01 Oct 2003

SECTION I. ADMINISTRATIVE DATA

All Courses Including This Lesson	<u>Course Number</u> 400-PLDC	<u>Version</u> 1	<u>Course Title</u> Primary Leadership Development Course												
Task(s) Taught(*) or Supported	<u>Task Number</u> 071-990-0010	<u>Task Title</u> Conduct Preparatory Marksmanship Training													
Reinforced Task(s)	<u>Task Number</u> None	<u>Task Title</u>													
Academic Hours	The academic hours required to teach this lesson are as follows:														
	<table border="0"> <tr> <td></td> <td><u>Resident Hours/Methods</u></td> </tr> <tr> <td></td> <td>1 hr 5 mins/ Conference / Discussion</td> </tr> <tr> <td></td> <td>45 mins/ Practical Exercise (Performance)</td> </tr> <tr> <td>Test</td> <td>0 hrs</td> </tr> <tr> <td>Test Review</td> <td>0 hrs</td> </tr> <tr> <td>Total Hours:</td> <td>2 hrs</td> </tr> </table>				<u>Resident Hours/Methods</u>		1 hr 5 mins/ Conference / Discussion		45 mins/ Practical Exercise (Performance)	Test	0 hrs	Test Review	0 hrs	Total Hours:	2 hrs
	<u>Resident Hours/Methods</u>														
	1 hr 5 mins/ Conference / Discussion														
	45 mins/ Practical Exercise (Performance)														
Test	0 hrs														
Test Review	0 hrs														
Total Hours:	2 hrs														
Test Lesson Number	<u>Hours</u> Testing (to include test review)	<u>Lesson No.</u> N/A													
Prerequisite Lesson(s)	<u>Lesson Number</u>	<u>Lesson Title</u>													
	None														
Clearance Access	Security Level: Unclassified Requirements: There are no clearance or access requirements for the lesson.														
Foreign Disclosure Restrictions	FD5. This product/publication has been reviewed by the product developers in coordination with the USASMA foreign disclosure authority. This product is releasable to students from all requesting foreign countries without restrictions.														

References

<u>Number</u>	<u>Title</u>	<u>Date</u>	<u>Additional Information</u>
TM 9-1265-211-10	OPERATOR'S MANUAL, MULTIPLE INTEGRATED LASER ENGAGEMENT SYSTEM (MILES) SIMULATOR SYSTEM, FIRING, LASER: M89 (NSN 1265-01-236-6725) FOR M16A1/M16A2 RIFLE AND SIMULATOR	28 Feb 1989	

Student Study Assignments

Before Class--

- Read SH-1 and SH-2.

During Class--

- Participate in the classroom discussion and practical exercise during the STX.

After Class--

- Turn in all recoverable material.

Instructor Requirements

1:8, SSG, PLDC graduate, ITC and SGITC qualified.

Additional Support Personnel Requirements

<u>Name</u>	<u>Stu Ratio</u>	<u>Qty</u>	<u>Man Hours</u>
None			

Equipment Required for Instruction

<u>ID Name</u>	<u>Stu Ratio</u>	<u>Instr Ratio</u>	<u>Spt</u>	<u>Qty</u>	<u>Exp</u>
1005-01-128-9936 RIFLE 5.56 MILLIMETER: M16A2	1:8		No	1	No
1265-01-236-6725 SIMULATOR SYSTEM FIRING LASER: M89	1:8	1:8	No	1	No
1265-ADAPTER ADAPTER, 5.56MM, M16A1/2	1:8		No	0	No
1265-MILESGUN MILES CONTROLLER GUN	1:8	1:8	No	1	No
441-06 LCD Projection System	1:8	1:1	No	1	No
559359 SCREEN PROJECTION	1:8	1:1	No	1	No
5820-00-T81-6161 VCR	1:8	1:1	No	1	No
6515-00-137-6345 EAR PLUGS, SET	1:8	1:1	No	1	No
673000T101700 PROJECTOR, OVERHEAD, 3M	1:8	1:1	No	1	No
703500T102257 DESKTOP/EPSON PRINTER	1:8	1:1	No	1	No
7110-00-132-6651 CHALKBOARD	1:8	1:1	No	1	No

7110-00-T81-1805 DRY ERASE BOARD	1:8	1:1	No	1	No
7510-01-424-4867 EASEL, (STAND ALONE) WITH PAPER	1:8	1:1	No	1	No
*DVC 07-56/ SIMULATOR SYS, FIRING, LASER, M16A1 (MILES)	1:1	1:1	No	2	No
*DVC 99-2 PROTECTIVE OVER-GARMENT	1:8	1:1	No	2	No
* Before Id indicates a TADSS					

**Materials
Required**

Instructor Materials:

- TM 9-1265-211-10 (SH-2)

Student Materials:

- Student Handout 1, Advance Sheet
- Student Handout 2, Extract from TM 9-1265-211-10

**Classroom,
Training Area,
and Range
Requirements**

GEN INSTRUCT BLDG (CLASSROOM SIZE 40X40 PER STUDENT)

BIVUOAC AREA (PE)

**Ammunition
Requirements**

<u>Id</u>	<u>Name</u>	<u>Exp</u>	<u>Stu Ratio</u>	<u>Instr Ratio</u>	<u>Spt Qty</u>
A080 -	CTG 5.56MM BLANK M200 F/RIFLE M16A1/M16A2	Yes	1:2	0:0	0

**Instructional
Guidance**

NOTE: Before presenting this lesson, instructors must thoroughly prepare by studying this lesson and identified reference material.

NOTE: Conduct this lesson at the beginning of the STX. Students must have weapons and earplugs for the sight alignment portion of the instruction.

Before class--

- Read and study all TSP material and be ready to conduct the class.
- This TSP has questions throughout to check on learning or generate discussion among the group members. You may add any questions you deem necessary to bring a point across to the group.
- You must know the information in this TSP well enough to teach from it.
- This TSP presents references to allow you to inform your students where they would look in the reference to follow your instruction.
- Instructor: Read all TSP material.

During class--

- Conduct the class IAW this TSP.

After class--

- Report any lesson discrepancies to the Senior Instructor. Conduct an after action review for the lesson.

**Proponent
Lesson Plan
Approvals**

<u>Name</u>	<u>Rank</u>	<u>Position</u>	<u>Date</u>
/s/Benjamin M. Salcido /t/Salcido, Benjamin M.	GS-09	Training Specialist	11 July 2003
/s/Brian H. Lawson /t/Barnes, Ronnie G.	MSG	Chief, PLDC	20 July 2003
/s/Brian H. Lawson /t/Lawson, Brian H.	SGM	Chief, NCOES	20 July 2003
/s/Albert J. Mays /t/Mays, Albert J.	SGM	Chief, CDDD	21 July 2003

SECTION II. INTRODUCTION

Method of Instruction: <u>Conference / Discussion</u>
Technique of Delivery: <u>Small Group Instruction (SGI)</u>
Instructor to Student Ratio is: <u>1:8</u>
Time of Instruction: <u>5 mins</u>
Media: <u>None</u>

Motivator

In the past, the most effective training for combat was the experience gained in combat itself. It was deadly, costly, and a soldier's first mistake often was his last. Sometimes, to add realism to training, the Army uses live ammunition. The use of live ammunition is dangerous, and it does not add the realism desired because the trainee knows the other guy isn't trying to hit him. Multiple Integrated Laser Engagement System (MILES) adds realism to combat training. With MILES, the other guy is trying to hit you; he may even do it. But, you'll get another try at him, and another, and another, until you are proficient and as ready for actual combat as modern technology can make you. During this lesson, we will place the MILES into operation.

Terminal Learning Objective

NOTE: Inform the students of the following Terminal Learning Objective requirements. At the completion of this lesson, you [the student] will:

Action:	Operate the Multiple Integrated Laser Engagement System (MILES).
Conditions:	In a tactical environment given an M16A1/A2, a MILES infantry system, and a Small Arms Alignment Fixture (SAAF) and SH-2.
Standards:	Operated the Multiple Integrated Laser Engagement System (MILES) by: <ul style="list-style-type: none">• Adjusting sights.• Engaging a target at 100 meters. IAW TM 9-1265-211-10 (SH-2).

Safety Requirements

Students must wear hearing protection when firing blank ammunition and enforce the minimum engagement range of six meters. Give students a safety briefing and include the warning statements from the inside cover of TM 9-1265-211-10 (see SH-2-2).

**Risk
Assessment
Level**

Low - Conduct a risk assessment at the local level based on conditions and use of equipment. Maintain a copy of the assessment on file.

**Environmental
Considerations**

NOTE: It is the responsibility of all soldiers and DA civilians to protect the environment from damage.

None

Evaluation

There is no evaluation for this lesson.

**Instructional
Lead-In**

None

SECTION III. PRESENTATION

NOTE: Inform the students of the Enabling Learning Objective requirements.

A. ENABLING LEARNING OBJECTIVE

ACTION:	Conduct preoperational inspection of the MILES infantry system.
CONDITIONS:	In a tactical environment given an M16A1/A2, a MILES infantry system, and a Small Arms Alignment Fixture (SAAF) and SH-2.
STANDARDS:	Conducted a preoperational inspection of the MILES infantry system IAW TM 9-1265-211-10 (SH-2).

1. Learning Step / Activity 1. Perform preoperational inspection of MILES system
Method of Instruction: Conference / Discussion
Technique of Delivery: Small Group Instruction (SGI)
Instructor to Student Ratio: 1:8
Time of Instruction: 25 mins
Media: None

At the completion of this instruction, you will be able to perform a preoperational inspection of MILES equipment and place the MILES equipment into operation.

Let's begin by identifying the components of the MILES infantry system.

QUESTION: What are the major components of the Miles infantry system?

ANSWER: The major components of the MILES infantry system are the Small Arms Transmitter (SAT) and the Man-Worn Laser Detector (MWLD).

Ref: TM 9-1265-211-10 (SH-2), pp SH-2-4 and SH-2-5

NOTE: Hold up each component for the students to see as they answer the question. Have the students follow along in Student Handout 2.

There are two items which support the major components; they are the controller gun and the Small Arms Alignment Fixture (SAAF) assembly.

Now let's take a closer look at these components. We will begin with the Small Arms Transmitter (SAT). The purpose of the SAT is to direct and fire a laser beam toward a desired target. Let's discuss the major parts of the SAT.

Ref: TM 9-1265-211-10 (SH-2), pp SH-2-9 thru SH-2-19

NOTE: Show each part to the students as you describe it.

We will begin with the laser tube. The SAT projects a laser beam from the laser tube toward a desired target. The window lens acts as a protective barrier for the laser tube.

The laser tube adjusters allow for horizontal (windage) and vertical (elevation) adjustment of the laser tube. Next we have the microphone which senses the sound of a blank when someone fires a SAT-equipped rifle. The microphone triggers the SAT's electronics which in turn fires the laser beam. The battery compartment houses a 9-volt battery needed to power the SAT. The key receptacle accepts the yellow weapon key. When in the ON position, the SAT is ready to fire. In the OFF position (90 degrees from IN/OUT or ON), battery power to the SAT is off. In the IN/OUT position, you can insert or remove the yellow key.

Next, let's look at the firing/low battery indicator light; it serves three functions.

- First, it flashes one to four times when you initially turn the SAT on to tell you that the SAT is operationally ready.
- Second, it momentarily flashes each time you fire a laser round to signify that you have fired the laser.
- And third, it flashes continually (approximately once a second) when the battery voltage is too low for normal operation.

The dry-fire trigger connector receptacle accepts the dry-fire trigger cable. When you are not using the SAT, you should use the slip-on cap to protect the dry-fire connector.

Finally, there is a rifle mounting bracket that allows you to mount the SAT to a weapon by using the diamond-shaped spring clamp and a securing clamp. As with most training aids, the SAT also has some limitations. For instance, even though the SAT has the same range and operational capabilities as the weapon you attach it to; a dirty transmitter laser tube window may reduce its effective range. Another limitation is that the SAT will only work as a semiautomatic in the dry-fire mode. While not a limitation, there is one thing you must be sure you do not do, and that is: **DO NOT** force the laser tube adjusters. If the adjusters do not move freely, you must inform your Small Group Leader (SGL) and have the SAT replaced.

CHECK ON LEARNING:

QUESTION: What part projects a laser beam at the desired target?

ANSWER: The laser tube.

Ref: TM 9-1265-211-10 (SH-2), p SH-2-9

QUESTION: What do the laser tube adjusters allow you to do?

ANSWER: They allow for horizontal (windage) and vertical (elevation) adjustment of the laser tube.

Ref: TM 9-1265-211-10 (SH-2), p SH-2-9

2. Learning Step / Activity 2. Inspecting and cleaning the MILES system
Method of Instruction: Conference / Discussion
Technique of Delivery: Small Group Instruction.
Instructor to Student Ratio: 1:8
Time of Instruction: 20 mins
Media: None

Now let's review the procedures for inspecting and cleaning the SAT. You should inspect and clean your SAT before and after every operation by following certain procedures.

QUESTION: What are the three inspection and cleaning steps you must follow for the SAT?

ANSWER: The cleaning and inspection steps are:

- First, remove any dirt, blank-fire residue, or oil from the laser tube window with lens paper or a soft cloth. You may have to wet the cloth to remove stubborn dirt.
- Next, ensure that the microphone aperture is free from dirt or blank-fire residue. Do not use a sharp object to clean the microphone aperture.
- The third thing you should do is check for damage which would prevent normal operation of the SAT.

Ref: TM 9-1265-211-10 (SH-2), p SH-2-10, para 2-4

NOTE: Use TM 9-1265-211-10 (SH-2), pp SH-2-13 thru SH-2-15 as a guide to demonstrate how to install the SAT on one of the student's weapons. Ask two students to help you during the demonstration. As a minimum, you should ensure that you cover the following:

- Battery installation.
- Mounting brackets.
- Installing the SAT on the M16A1/A2.

QUESTION: What are the two modes of operation?

ANSWER: They are the blank-fire mode and the dry-fire mode.

Ref: TM 9-1265-211-10 (SH-2), pp SH-2-16 and SH-2-18

NOTE: Explain each of the modes.

Ref: SH-2, pp SH-2-20 to SH-2-25

The next component we will discuss is the Man-Worn Laser Detector assembly (MWLD). The purpose of the MWLD is to receive the laser transmissions and determine if the laser beam was a near-miss or if it killed the targeted soldier. The MWLD consists of a helmet harness and a torso harness. The helmet harness assembly has three major parts.

NOTE: Have one of the students point to the part as you describe it.

The first part is the electronics module that contains the battery and all the components needed to operate the helmet harness.

The second are the five detectors that receive the laser beam.

Finally, the third part is the inductive loop that acts as an antenna so that once a laser beam activates the helmet, the loop transfers the "hit" to the torso harness, which in turn, activates the alarm system.

The torso harness assembly consists of five major parts.

The first major part is the electronics module that contains the battery and all the components needed to operate the torso harness.

The second part is the eight detectors, which receive the laser beam. Next is the alarm that sounds a tone when the laser beam strikes the MWLD. The fourth part is the key receptacle, the device that receives the weapon key. You have to insert the yellow weapon key into the key receptacle to turn off the alarm.

The fifth major part is the inductive loop and it receives the helmet generated kill or near-miss information. The last major part of the torso harness is the four hooks you use to attach the torso harness to the hip-worn web belt. As with the SAT, the MWLD has some limitations. Typically, each BA-3090/U 9-volt alkaline battery provides just 100 hours of normal use. Therefore, after each 100 hours of use you must replace the MWLD BA-3090/U 9-volt battery. Also, when the yellow weapon key is in the key receptacle, you will not disable the decoding, and when you remove the key, the appropriate kill alarms will sound until you reset the system.

Now let's see what the procedures are for inspecting and cleaning the MWLD.

First, you must wipe the 13 detectors on the helmet and torso harness with a clean cloth.

Second, inspect the helmet and torso harness for damage which would prevent normal operation.

NOTE: Refer to extract from TM 9-1265-211-10 (SH-2), SH-2-25 thru SH-2-26, and demonstrate to the students how to install and test batteries in the MWLD.

The MILES system is now ready for operation.

CHECK ON LEARNING:

QUESTION: What is the purpose of the MWLD?

ANSWER: The purpose of the MWLD is to receive the laser transmission beams and determine if the laser beam was a near-miss or if it killed the targeted soldier.

Ref: TM 9-1265-211-10 (SH-2), p SH-2-20

QUESTION: What does the insertion of the weapon key accomplish?

ANSWER: It turns the alarm off.

Ref: TM 9-1265-211-10 (SH-2), p SH- 2-21

B. ENABLING LEARNING OBJECTIVE

ACTION:	Adjust sights to engage target with the MILES laser transmitter.
CONDITIONS:	In a tactical environment given an M16A1/A2, a MILES infantry system, a Small Arms Alignment Fixture (SAAF) and SH-2.
STANDARDS:	Adjusted the sights to engage a target with the MILES laser transmitter IAW TM 9-1265-211-10 (SH-2).

1. Learning Step / Activity 1. Engage Target with MILES Transmitter
Method of Instruction: Practical Exercise (Performance)
Technique of Delivery: Small Group Instruction (SGI)
Instructor to Student Ratio: 1:8
Time of Instruction: 45 mins
Media: Practical Exercise (PE)

Adjusting the laser transmitter on the MILES system serves the same purpose as zeroing your weapon on a range. It gives you the ability to hit what you aim at. With the MILES system you zero the SAT to the weapon. First, set your weapon's sights to your battle sight zero. **DO NOT** adjust your weapon's sights; instead, adjust your SAT laser adjusters. You use the SAAF to accomplish this.

NOTE: Use student handout, pp SH-2-29 thru SH-2-33, and have each student adjust his/her SAT so that he/she can engage a target at 100 meters.

SECTION IV. SUMMARY

Method of Instruction: <u>Conference / Discussion</u>
Technique of Delivery: <u>Small Group Instruction (SGI)</u>
Instructor to Student Ratio is: <u>1:8</u>
Time of Instruction: <u>5 mins</u>
Media: <u>None</u>

Check on Learning

The practical exercise serves as the check on learning.

Review / Summarize Lesson

MILES is the closest simulation to actual combat to date. It tests your skills and builds a competitive spirit. The idea of the MILES system is to find out the tactical mistakes you're making so you can correct them before you become a human target for live ammunition in combat. During the last two hours we conducted preoperational inspections on the MILES system, put the system into operation, and learned how to adjust the sights on the MILES system.

SECTION V. STUDENT EVALUATION

**Testing
Requirements**

NOTE: Describe how the student must demonstrate accomplishment of the TLO. Refer student to the Student Evaluation Plan.

**Feedback
Requirements**

NOTE: Feedback is essential to effective learning. Provide remedial training as needed.

Appendix A Viewgraph Masters (N/A)

Appendix B Test(s) and Test Solution(s) (N/A)

PRACTICAL EXERCISE 1 SHEET T225

Title	Adjust sights to engage target with MILES laser transmitter						
Lesson Number/Title	T225 version 1 / Operate The Multiple Integrated Laser Engagement System (MILES)						
Introduction	<p>During the past hour we discussed how the MILES works and its purpose. The practical exercise that you are about to take reinforces what you learned in class and will give you confidence in the MILES.</p>						
Motivator	<p>This practical exercise gives you the opportunity to use the MILES before becoming a human target during combat.</p>						
Terminal Learning Objective	<p>NOTE: The instructor should inform the students of the following Terminal Learning Objective covered by this practical exercise.</p> <p>At the completion of this lesson, you [the student] will:</p> <table><tr><td>Action:</td><td>Operate the Multiple Integrated Laser Engagement System (MILES).</td></tr><tr><td>Conditions:</td><td>In a tactical environment given an M16A1/A2, a MILES infantry system, and a Small Arms Alignment Fixture (SAAF) and SH-2.</td></tr><tr><td>Standards:</td><td><p>Operated the Multiple Integrated Laser Engagement System (MILES) by:</p><ul style="list-style-type: none">• Adjusting sights.• Engaging a target at 100 meters.<p>IAW TM 9-1265-211-10 (SH-2).</p></td></tr></table>	Action:	Operate the Multiple Integrated Laser Engagement System (MILES).	Conditions:	In a tactical environment given an M16A1/A2, a MILES infantry system, and a Small Arms Alignment Fixture (SAAF) and SH-2.	Standards:	<p>Operated the Multiple Integrated Laser Engagement System (MILES) by:</p> <ul style="list-style-type: none">• Adjusting sights.• Engaging a target at 100 meters. <p>IAW TM 9-1265-211-10 (SH-2).</p>
Action:	Operate the Multiple Integrated Laser Engagement System (MILES).						
Conditions:	In a tactical environment given an M16A1/A2, a MILES infantry system, and a Small Arms Alignment Fixture (SAAF) and SH-2.						
Standards:	<p>Operated the Multiple Integrated Laser Engagement System (MILES) by:</p> <ul style="list-style-type: none">• Adjusting sights.• Engaging a target at 100 meters. <p>IAW TM 9-1265-211-10 (SH-2).</p>						
Safety Requirements	All students must wear hearing protection. Enforce the minimum engagement range of six meters.						
Risk Assessment Level	Low. Conduct a risk assessment at the local level based on conditions and use of equipment. Maintain a copy of the assessment on file.						
Environmental Considerations	None						
Evaluation	This is not a graded PE.						
Instructional Lead-In	None						

Resource Requirements**Instructor Materials:**

- TM 9-1265-211-10

Student Materials:

Each student needs--

- One MILES infantry system
 - Individual weapon with blank adapter
 - One set of ear plugs
-

Special Instructions

You have 45 minutes to complete this exercise.

Procedures

NOTE: Use TM 9-1265-211-10 (SH-2), pages SH-2-29 thru SH-2-33, and have each student adjust his/her SAT so that he/she can engage a target at 100 meters.

Feedback Requirements

None

HANDOUTS FOR LESSON 1: T225 version 1

**This Appendix
Contains** This appendix contains the items listed in this
table--

Titles/Synopsis	Pages
SH-1, Advance Sheet	SH-1-1 and SH-1-2
SH-2, Extracted from TM 9-1265-211-10	SH-2-1 thru SH-2-33

Student Handout 1

This handout contains the Advance Sheet.

Student Handout 1

Advance Sheet

Lesson Hours This lesson consists of one hour of small group instruction and a one-hour practical exercise.

Overview In the past, the most effective training for combat was the experience gained in combat itself. It was deadly, costly, and a soldier's first mistake often was his last. Sometimes, to add realism to training, the army uses live ammunition. The use of live ammunition is dangerous, and it does not add the realism desired because the trainee knows the other guy isn't trying to hit him. Multiple Integrated Laser Engagement System (MILES) adds realism to combat training. With MILES, the other guy is trying to hit you, he may even do it. But, you'll get another try at him, and another, and another, until you are proficient and as ready for actual combat as modern technology can make you. During this lesson we will place the MILES into operation.

Learning Objective Terminal Learning Objective (TLO)

Action	Operate the Multiple Integrated Laser Engagement System (MILES).
Conditions:	In a tactical environment given an M16A1/A2, a MILES infantry system, and a Small Arms Alignment Fixture (SAAF) and SH-2.
Standards:	Operated the Multiple Integrated Laser Engagement System (MILES) by: <ul style="list-style-type: none">• Adjusting sights.• Engaging a target at 100 meters. IAW TM 9-1265-211-10 (SH-2).

ELO A Conduct preoperational inspection of the MILES infantry system.

ELO B Adjust sights to engage target with the MILES laser transmitter.

Assignment The student assignment for this lesson is:

- Read TM 9-1265-211-10 (SH-2).
-

Additional Subject Areas None

Bring to Class

- Assigned M16A1/A2.
- Hearing protection.
- Pen or pencil and writing paper.
- All reference material received for this lesson.

Student Handout 2

This student handout contains paragraph 3-8, FM 21-11, and 32 pages extracted from TM 9-1265-211-10.

RECOVERABLE PUBLICATIONS

YOU RECEIVED THIS DOCUMENT IN A DAMAGE-FREE CONDITION. DAMAGE IN ANYWAY, TO INCLUDE HIGHLIGHTING, PENCIL MARKS, OR MISSING PAGES, WILL SUBJECT YOU TO PECUNIARY LIABILITY (STATEMENT OF CHARGES, CASH COLLECTION, ETC.) TO RECOVER PRINTING COSTS.

WARNING

Although the laser light emitted by MILES laser transmitters is considered eye safe by the Bureau of Radiological Health, suitable precautions must be taken to avoid possible eye damage from overexposure to this radiated energy. Take the following precautions:

Never look at the laser emitter at close range (less than 12 meters).

Never look at laser emitter through optics such as binoculars, telescope, or weapon sights at range less than 75 meters.

Never look at the laser emitter directly along the axis of the bore of the weapon.

**Follow the Laser Range Safety Procedures in AR 385-63 and TB MED 279.
For information on first aid, see excerpt from FM 21-11 below.**

3-8. Dressings and Bandages (081-831-1033)

a. Eye Injuries. The eye is a vital sensory organ, and blindness is a severe physical handicap. Timely first aid of the eye not only relieves pain but also helps prevent shock, permanent eye injury, and possible loss of vision. Because the eye is very sensitive, any injury can be easily aggravated if it is improperly handled. Injuries of the eye may be quite severe. Cuts of the eyelids can appear to be very serious, but if the eyeball is not involved, a person's vision usually will not be damaged. However, lacerations (cuts) of the eyeball can cause permanent damage or loss of sight.

(4) Burns of the eyes. Chemical burns, thermal (heat) burns, and light burns can affect the eyes.

(c) Light burns. Exposure to intense light can burn an individual. Infrared rays, eclipse light (if the casualty has looked directly at the sun), or laser burns cause injuries of the exposed eyeball. Ultraviolet rays from arc welding can cause a superficial burn to the surface of the eye. These injuries are generally not painful but may cause permanent damage to the eyes. Immediate first aid is usually not required. Loosely bandaging the eyes may make the casualty more comfortable and protect his eyes from further injury caused by exposure to other bright lights or sunlight.

CHAPTER 1 GENERAL INFORMATION

1.1 INTRODUCTION

The instructions and procedures contained in this manual are intended for use by operating personnel of the Multiple Integrated Laser Engagement System (MILES) Infantry System.

NOTE:

This publication contains application instructions pertaining to the M16A1, M16A2 and M249 SAW for the equipment listed. Do not confuse with earlier equipment identified as Simulator System, Firing, Laser: M60 for M16A1 Rifle (NSN 1265-01-085-1583).

1.2 HOW TO USE THIS MANUAL

Chapter 1 is a general overview of the purpose and identification of the total Infantry System. Each following chapter deals with a particular component of the system and all related information needed by the operator to use that component. To perform the procedures discussed in this manual, the operating personnel must be able to:

- load and fire blank ammunition
- install a Blank-Fire Attachment (BFA) on the M16A1 and M16A2 rifles and on the M249 Squad Automatic Weapon (SAW)
- requisition basic military equipment through proper channels
- return defective equipment for servicing

It is suggested that this manual be read in its entirety to familiarize the reader with the total system.

1.3 PURPOSE OF EQUIPMENT

The purpose of the Infantry System is to provide realistic combat training exercise without using live ammunition.

The Infantry System is comprised of battery-powered laser transmitters and detector assemblies. When fired, the transmitter sends an invisible beam of radiated energy (laser) toward a target. The target is outfitted with the detector assembly, which senses the laser beam and sounds an alarm. The alarm sounds in different tones, indicating whether the target was KILLED or NEAR MISSED by the laser beam. Support equipment for the Infantry System includes a Controller Gun, which is used by the umpire (or Controller) of the training exercise. A Small Arms Alignment Fixture (SAAF) is used to align the transmitter to the weapon sights of the weapon and to verify the operability of the transmitter.

1.4 EQUIPMENT

Figure 1-1 illustrates and identifies the major components and Figure 1-2 the support equipment of the Infantry System. They are the:

- Small Arms Transmitter (SAT) assembly
- Man-Worn Laser Detector (MWLD) assembly, which includes the Helmet and Torso Harnesses
- Controller Gun assembly
- Small Arms Alignment Fixture (SAAF) assembly

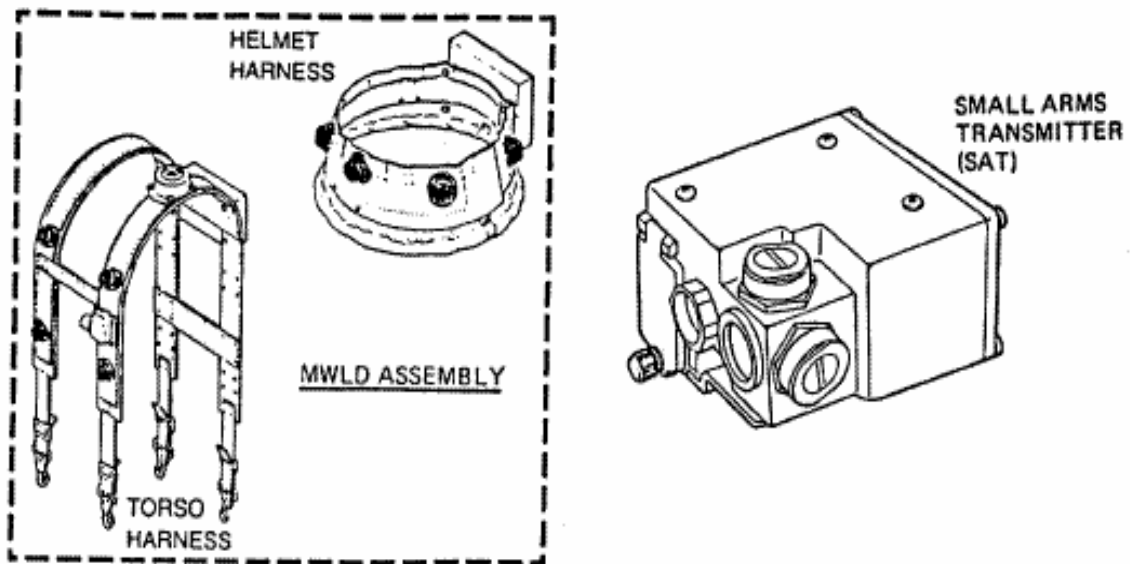


FIGURE 1-1. Infantry System

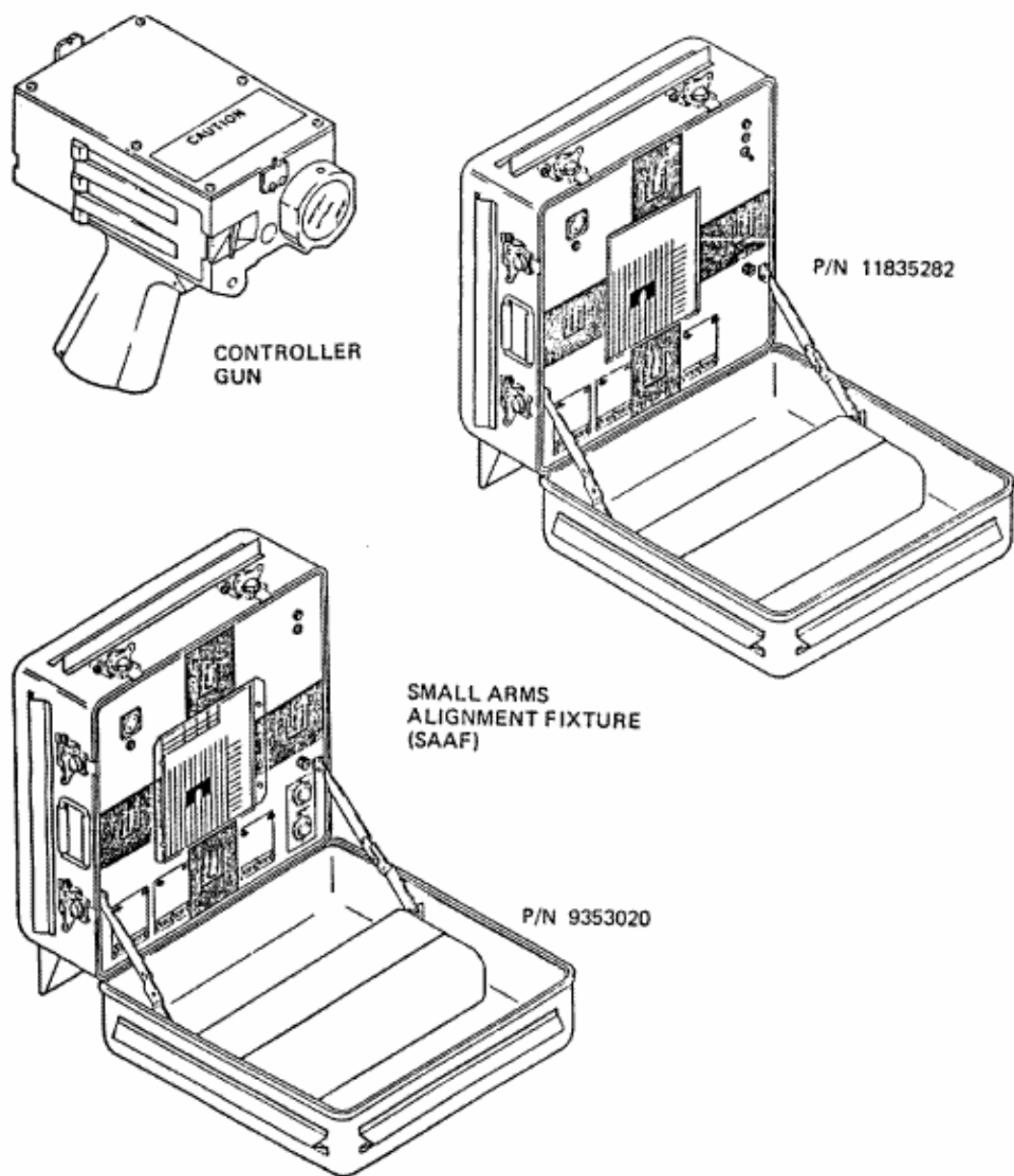


FIGURE 1-2. Support Equipment

Figure 1-3 illustrates the location of the MWLD and SAT assemblies.

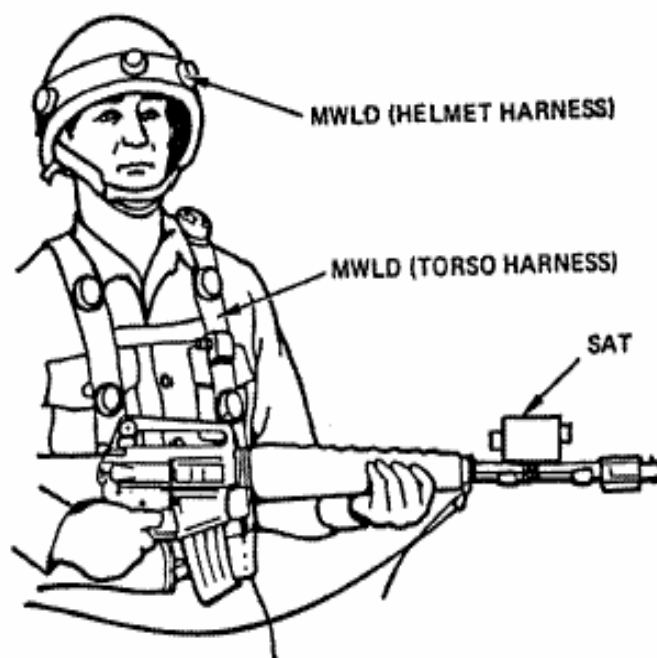


FIGURE 1-3. Infantry System Equipment Location

1.5 LIST OF TERMS

Refer to Table 1-1 for definitions of commonly used terms associated with the MILES Infantry System.

TABLE 1-1. TERMINOLOGY

TERM	DEFINITION
Adapter	Allows the Small Arms Transmitter to be attached onto the M16A1 or M16A2 rifles and the M249 Squad Automatic Weapon.
Alarm	Once the Man-Worn Laser Detector assembly senses a laser beam directed towards it, this alarm sounds different tones to signify which condition (KILLED or NEAR MISS) the target has suffered. The alarm is located on the Torso Harness.
BLANK-FIRE Mode	In a training exercise, when the Small Arms Transmitter is being used with blank ammunition.
Controller	The umpire of the training exercise.
Controller Gun	A hand-held, laser transmitting device used to (1) test the operability of the Infantry System, (2) disqualify soldiers from the exercise, and (3) determine the status of a target.
Controller Key (green)	This is a green WEAPON key used by the Controller to reset the Man-Worn Laser Detector assembly once a KILL has occurred. This key is used in the key receptacle located on the Torso Harness.
Detectors	Devices which sense a laser beam directed towards them. These devices are located on the Torso and Helmet Harnesses.
DRY-FIRE Mode	In a training exercise, when the Small Arms Transmitter is being used without blank ammunition
DRY-FIRE Trigger Cable	A cable assembly which allows the use of the Small Arms Transmitter in DRYFIRE mode. One end of this cable slips over the trigger of the rifle and the other end connects to the J1 connector located on the transmitter.
Helmet Harness	The part of the Man-Worn Laser Detector assembly worn over the combat helmet.
KILL	The condition which indicates that the person wearing the Man-Worn Laser Detector assembly has been hit and totally disabled by a laser beam. The alarm sounds continuously to designate this condition.
Laser Beam	In this application, an invisible beam of light projected from a transmitter which is used to simulate weapon fire.
Man-Worn Laser Detector Assembly	This assembly consists of the Helmet and Torso Assembly Harness assemblies worn by military personnel.
NEAR MISS	The condition which indicates that laser fire is being directed towards a person wearing the Man-Worn Laser Detector assembly. The alarm sounds momentarily to designate this condition in lieu of a continuous tone.
Small Arms Alignment Fixture	A laser detecting device used to align the Small Fixture Arms Transmitter laser beam to the weapon sights of the rifle.
Small Arms Transmitter	A laser transmitting device, attached to the rifle, which is used to direct and fire a laser beam towards a desired target.
Torso Harness	The part of the Man-Worn Laser Detector assembly which is worn on the upper body.
WEAPON Key (yellow)	This is a yellow WEAPON key which is used to (1) turn on the Small Arms Transmitter and (2) silence the alarm on the Man-Worn Laser Detector assembly.

TABLE 1-1. TERMINOLOGY, continued

TERM	DEFINITION
Key Receptacles	Devices on the Small Arms Transmitter and the Torso Harness which receive the WEAPON keys.
Universal Adapter	Allows the Small Arms Transmitter to be attached onto the M16A1 or the M16A2 rifle.

CHAPTER 2

SMALL ARMS TRANSMITTER

2.1 INTRODUCTION

This chapter describes the inspection, cleaning, installation, operation, alignment, handling, and storage of the Small Arms Transmitter (SAT).

2.2 EQUIPMENT DESCRIPTION

The purpose of the SAT is to direct and fire a laser beam toward a desired target. Refer to Figure 2-1 for an illustrated view of the SAT assembly, which consists of the following major parts.

LASER TUBE and WINDOW the laser tube projects the laser beam toward a desired target. The glass window lens acts as a protective barrier for the laser tube.

LASER TUBE ADJUSTORS allow for horizontal (windage) and vertical (elevation) adjustment of the laser tube.

MICROPHONE senses the sound of a blank when a SAT-equipped rifle is fired. The microphone triggers the SATs electronics which, in turn, fire the laser beam.

BATTERY COMPARTMENT houses a 9 volt, alkaline transistor-style battery which is needed to power the SAT.

KEY RECEPTACLE accepts the yellow WEAPON key. Provides the following functions:

1. In the ON position, the SAT is ready to fire.
2. In the off position (90 degrees from IN/OUT or ON), battery power to the SAT is off.
3. In the IN/OUT position, the yellow key may be installed or removed.

FIRING/LOW BATTERY INDICATOR LIGHT provides the following indications:

1. Operational: flashes 1 to 4 times when the SAT is initially turned ON. Indicates that the SAT is operationally ready.
2. Firing: momentarily flashes each time a laser round is fired.
3. Low Battery Voltage: flashes continually (approximately once a second) when battery voltage is too low for normal operation.

DRY-FIRE TRIGGER CONNECTOR RECEPTACLE (J1) accepts the DRY-FIRE trigger cable. The DRY-FIRE cable is not included with the Infantry System and must be issued separately.

When not in use, a slip-on cap is used to protect the DRY-FIRE connector. This cap is attached to the SAT by a lanyard.

RIFLE MOUNTING BRACKET allows the SAT to mount onto the weapons. It is made up of a diamond shaped spring clamp and a securing clamp.

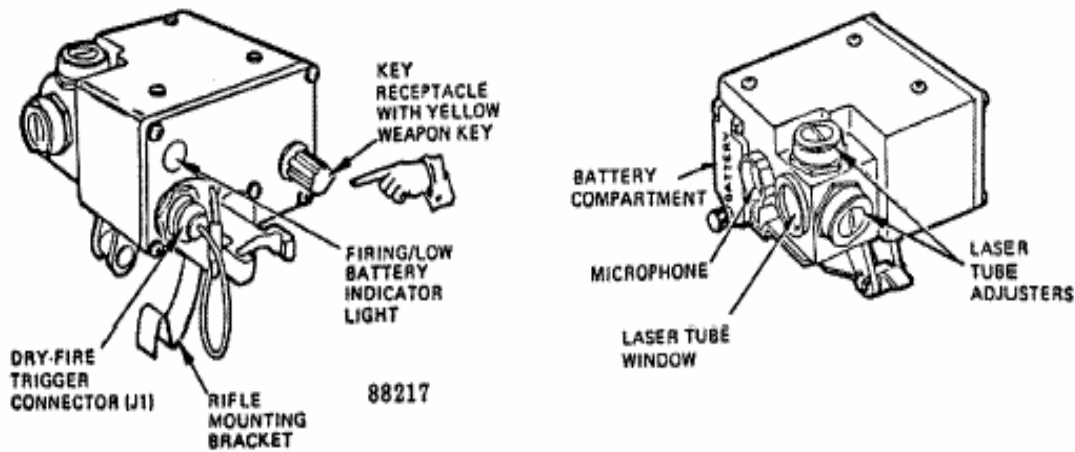


FIGURE 2-1. SAT Assembly

2.3 LIMITATIONS OF EQUIPMENT

The following limitations pertain to the SAT:

1. Even though the SAT has the same range and operational capabilities as the weapons, a dirty transmitter laser tube window may reduce its effective range.
2. In the DRY-FIRE mode, only semi-automatic (single shot) operation of the SAT is possible.
3. Do not force the laser tube adjusters. If the adjusters do not move freely, replace the SAT.

2.4 INSPECTION AND CLEANING

Refer to Figure 2-2 while performing the inspection and cleaning procedures for the SAT which follow:

1. Remove any dirt, blank-fire residue, or oil from the laser tube window with lens paper or a soft cloth. The cloth may be wet to remove stubborn dirt.
2. Ensure that the microphone aperture is not caked with dirt or blank-fire residue.

CAUTION

Do not use a sharp object to clean the microphone aperture.

3. Check for damage, which would prevent normal operation of the SAT.

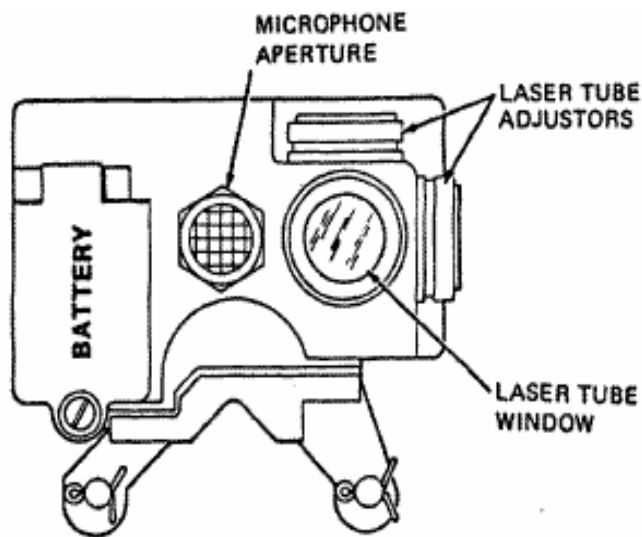


FIGURE 2-2. *Inspecting and Cleaning the SAT*

2.5 INSTALLATION

The following items must be installed:

- 9 volt, alkaline battery in the SAT
- SAT on the weapon barrel

2.5.1 Battery Installation

Refer to Figure 2-3 while performing these procedures.

To install the 9 volt battery in the SAT:

1. Ensure that the yellow WEAPON key is either not installed or in the off position (90 degrees from IN/OUT or ON).
2. Locate the compartment marked BATTERY on the front of the SAT. Notice that the door of the compartment is secured by a captive thumbscrew.
3. Loosen the thumbscrew with your fingers and open the compartment door.
4. With the electrical contacts pointing into the compartment, place the battery into the compartment. Polarity of the contacts is not important.
5. Close the battery compartment door and hand-tighten the thumbscrew.

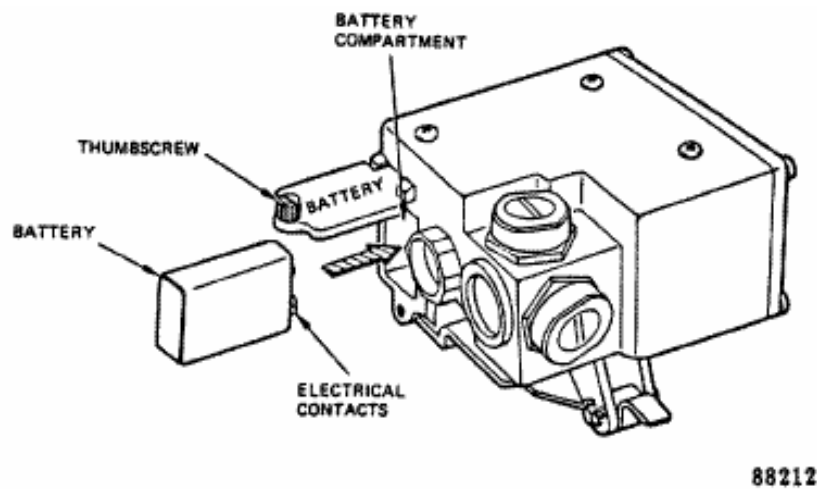


FIGURE 2-3. SAT Battery Installation

2.5.2 Mounting Brackets

The SAT system is equipped with two types of weapon mounting brackets. These brackets allow the SAT to be used with:

- the Squad Automatic Weapon (SAW)
- either the M16A1 or the M16A2 rifle (universal bracket)

The bracket used with the SAW may be identified by the long shaft that rests on the barrel. Figure 2-4 illustrates the SAW mounting bracket.

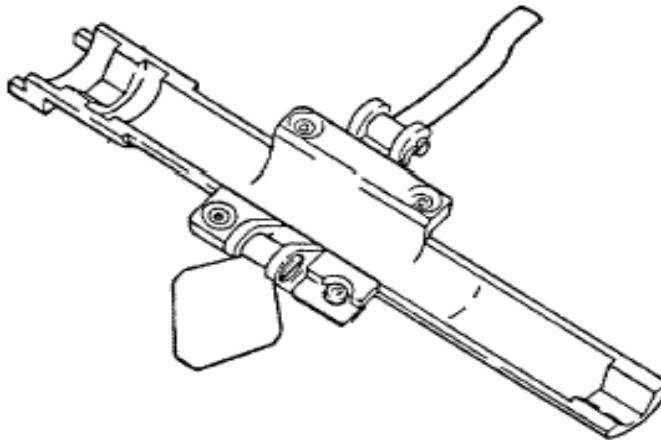


FIGURE 2-4. SAW Mounting Bracket

The universal bracket incorporates a spacer that enables the SAT to be mounted on either an M16A1 or M16A2 rifle. Refer to Figure 2-5 for an illustrated view of the universal bracket.

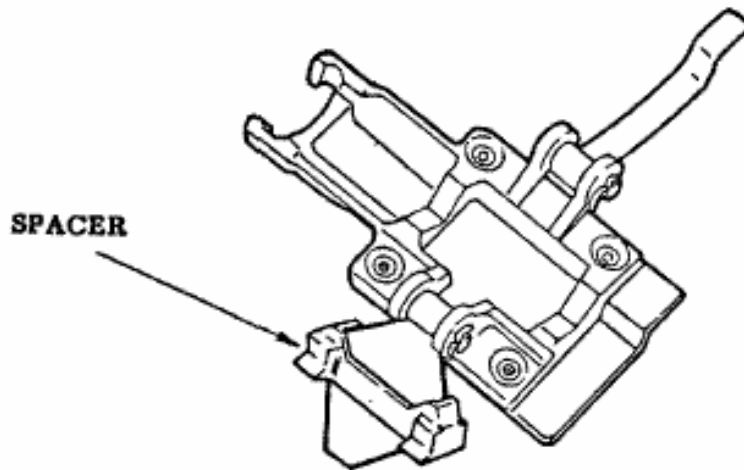


FIGURE 2-5. Universal Mounting Bracket

CAUTION

Before mounting the SAT on a weapon, ensure that you are using the proper bracket or damage may occur to the weapon.

2.5.3 Installing the SAT on the SAW Barrel

Refer to Figure 2-6 while performing these procedures. Note that the call-outs used on the figure correspond with the procedural steps.

To install the SAT on the SAW barrel:

1. Open the Bipod and place the weapon on a flat surface.
2. Open the SAT's spring clamp. Flip back the diamond-shaped clamp.
3. With the sight guides pointing toward the user and the two clamps pointing down, mate the SAT to the SAW's barrel. Place the sight guides straddling the weapon's front sight post and carefully lower the SAT until it rests on the barrel.
4. Position the SAT as shown and close the diamond-shaped clamp. Close and lock the spring clamp by applying pressure to the center.

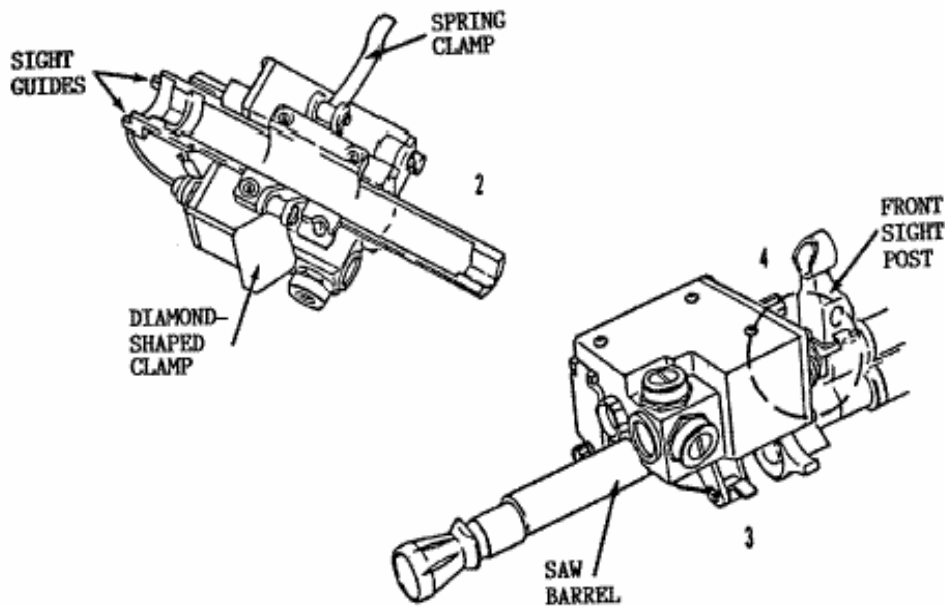


FIGURE 2-6. Installing the SAT on the SAW Barrel

2.5.4 Installing the SAT on the M16A1

Refer to Figure 2-7 while performing these procedures. Note that the call-outs used on the figure correspond with the procedural steps.

Attach the SAT to the rifle barrel as follows when using an M16A1 rifle:

1. Open the spring clamp and the diamond-shaped clamp. Hold the SAT with both clamps fully open and the sight guides pointing toward the user.
2. Position the rifle so the shoulder stock is supported and the user is looking straight down into the magazine well.
3. Mate the SAT to the rifle's barrel by positioning the sight guides of the SAT so they straddle the front sight post of the rifle. Lift the SAT until it makes contact with the rifle barrel.
4. While closing the diamond-shaped clamp, position the spacer on the center of the barrel.
5. Close and lock the SAT in place by positioning the spring clamp over the diamondshaped clamp and pressing in the center.

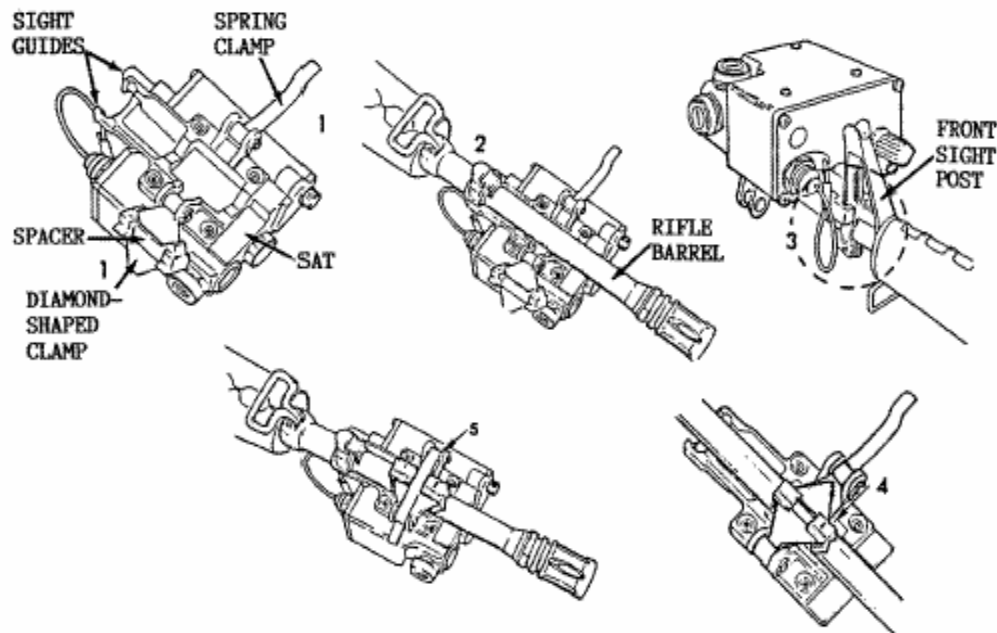


FIGURE 2-7. Installing the SAT on the M16A1 Using the Universal Bracket

2.5.5 Installing the SAT on the M16A2

Refer to Figure 2-8 while performing these procedures. Note that the call-outs used on the figure correspond with the procedural steps.

Attach the SAT to the rifle barrel as follows when using an M16A2 rifle:

1. Open the spring clamp and the diamond-shaped clamp. Hold the SAT with both clamps fully open and the sight guides pointing toward the user.
2. Position the rifle so the shoulder stock is supported and the user is looking straight down into the magazine well.
3. Mate the SAT to the rifle's barrel by positioning the sight guides of the SAT so they straddle the front sight post of the rifle. Lift the SAT until it makes contact with the rifle barrel.
4. While closing the diamond-shaped clamp, position the spacer to the side of the rifle barrel.
5. Close and lock the SAT in place by positioning the spring clamp over the diamond shaped clamp and pressing in the center.

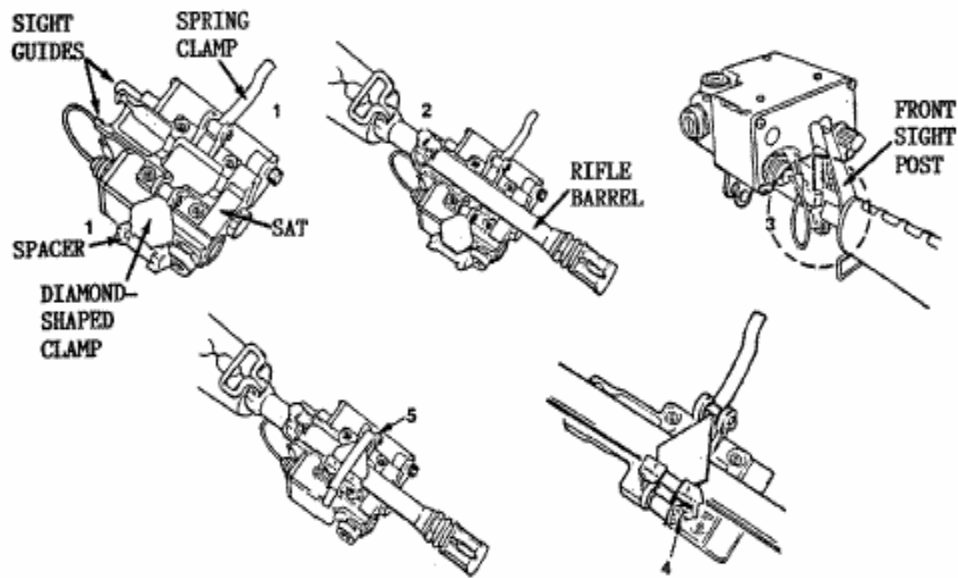


FIGURE 2-8. Installing the SAT on the M16A2 Using the Universal Bracket

2.6 OPERATION

The SAT may be operated in either of two modes:

- BLANK-FIRE mode
- DRY-FIRE mode

NOTE

For the SAT to perform any operational function, the yellow WEAPON key must be in the ON position.

2.6.1 BLANK-FIRE Mode

To operate the SAT in BLANK-FIRE mode:

1. Obtain a Blank-Fire Attachment (BFA).
2. Put the covered side of the BFA on the barrel of the rifle so that the covered side is towards the SAT's laser tube window (see Figure 2-9). This will protect the window from the muzzle blast residue.
3. Insert a magazine with blank cartridges in the rifle.
4. Insert the yellow WEAPON key into the key receptacle on the SAT. Push in and turn the key clockwise to the ON position.

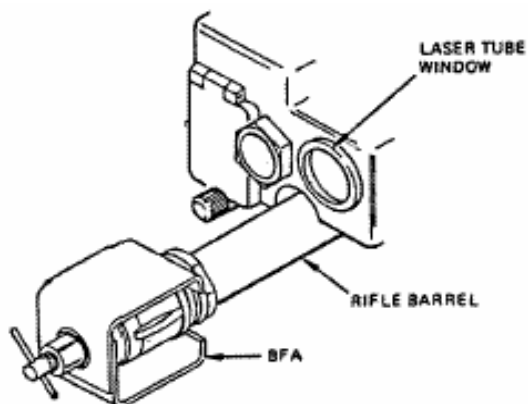


FIGURE 2-9. BLANK-FIRE Attachment (typical)

NOTE

Refer to Figure 2-10. The FIRING indicator light will flash 1 to 4 times and stop. This flashing indicates that the unit is operational. However, if the flashing continues, it indicates that the battery voltage is too low for normal operation. The battery should then be replaced before continuing.

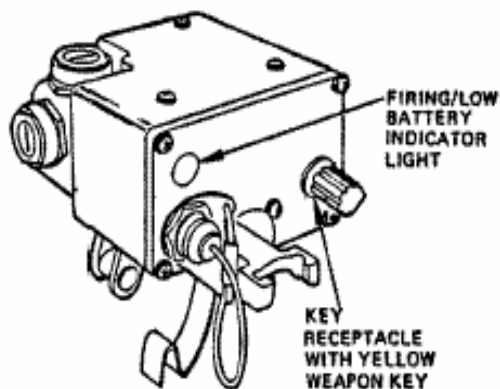


FIGURE 2-10. SAT Rear View

5. Chamber the first round of blank ammunition in the rifle.

WARNING

Avoid viewing the laser emitter directly along the optical axis of the radiated beam.

6. While watching the FIRING indicator light, fire one round. The FIRING light should illuminate briefly.

NOTE

If there is no illumination, fire again. If there is still no illumination, replace the SAT. Tag defective items as appropriate.

2.6.2 DRY-FIRE Mode

NOTES

1. During DRY-FIRE operation, the SAT will only fire in semiautomatic (single-shot) mode. The trigger must be squeezed once and released once for each round.
2. DRY-FIRE mode may be used with either the M16A1 or M16A2 rifle. With some adjustments, the DRY-FIRE cable may be used to operate the SAW in DRY-FIRE mode, however, it is not primarily designed to do so.

Refer to Figure 2-11 while performing the following steps.

To operate in the DRY-FIRE mode:

1. Obtain a DRY-FIRE trigger cable assembly. Ensure that the cable assembly has no cracks or tears. Check for bent pins in the connector. Ensure that there are two fastener tape straps on the cable.
2. On the rear of the SAT, remove the protective cap from receptacle J1.
3. Insert the connector located on the DRY-FIRE trigger cable into receptacle J1 by aligning the half circles in both connectors. Push the connector into position.
4. Wrap one fastener strap around the vent holes on the upper hand guards of the rifle.
5. Wrap the other fastener strap around the upper hand guard slip ring.
6. Cock the rifle. Open the trigger guard using a small probe.
7. Route the cable under the dust cover and gently push the trigger button up over the trigger.
8. Close the trigger guard.
9. Turn the yellow WEAPON key to the ON position.

NOTE

The FIRING indicator light should flash 1 to 4 times and stop. This flashing indicates that the unit is operational. However, if the flashing continues, it indicates that the battery voltage is too low for normal operation. The battery should then be replaced.

10. Squeeze the trigger button. The red FIRING indicator light should illuminate briefly.

NOTE

If there is no illumination, replace the SAT.

CAUTION

To remove the DRY-FIRE cable, pull on the connector shell and not the cable insulation.

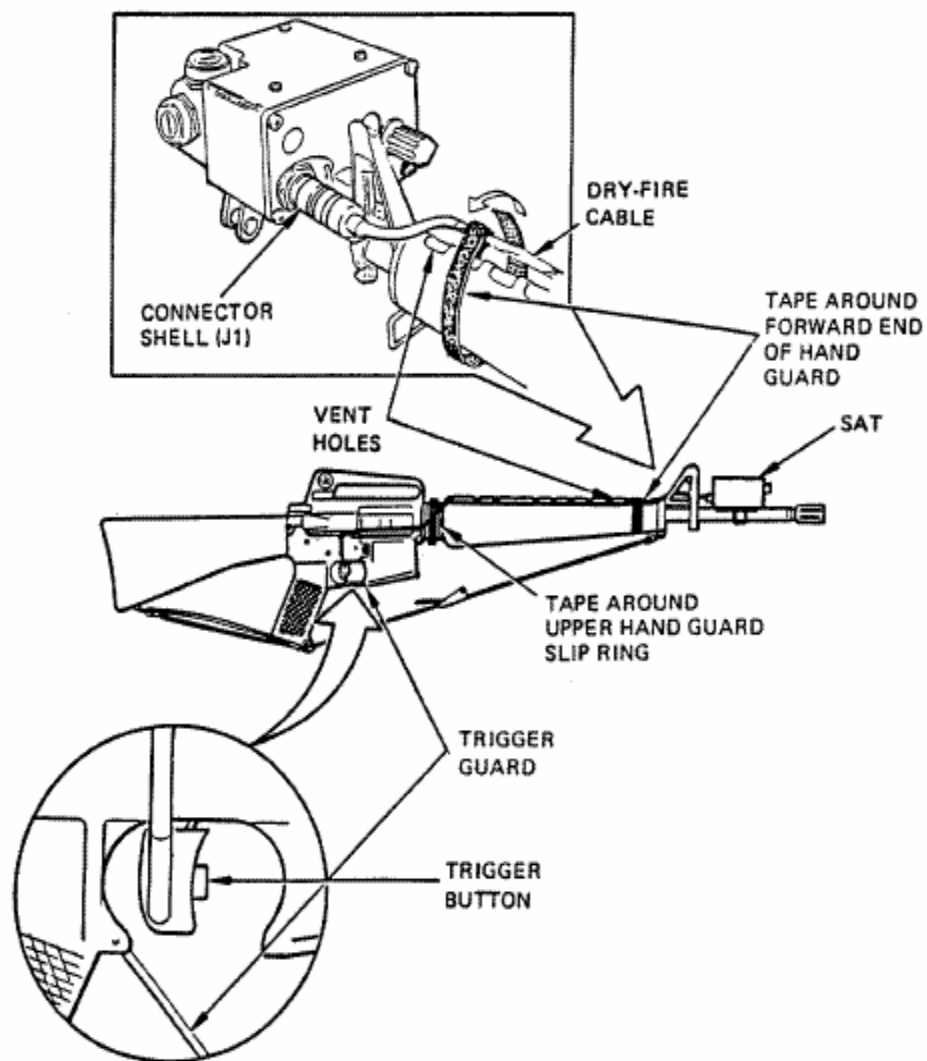


FIGURE 2-11. DRY-FIRE Cable Installation

CHAPTER 3 MAN-WORN LASER DETECTOR ASSEMBLY

3.1 INTRODUCTION

This chapter describes the inspection, cleaning, installation, operation, handling, and storage of the Man-Worn Laser Detector (MWLD) assembly.

3.2 EQUIPMENT DESCRIPTION

The MWLD assembly is made up of:

- a Helmet Harness assembly
- a Torso Harness assembly

The MWLD assembly is worn by soldiers involved in the training exercise. The purpose of the MWLD assembly is to receive the laser transmissions (beams) and determine whether the targeted soldier was NEAR MISSED or KILLED by the laser beam.

3.2.1 Helmet Harness

Refer to Figure 3-1 for an illustrated view of the Helmet Harness assembly which consists of the following major parts.

ELECTRONICS MODULE	contains the battery and all the components needed to operate the Helmet Harness.
5 DEECTORS	receive the laser beam
INDUCTIVE LOOP	acts as an antenna so that once the helmet is activated by the laser beam, the loop transfers this information to the Torso Harness which, in turn, activates the alarm system.

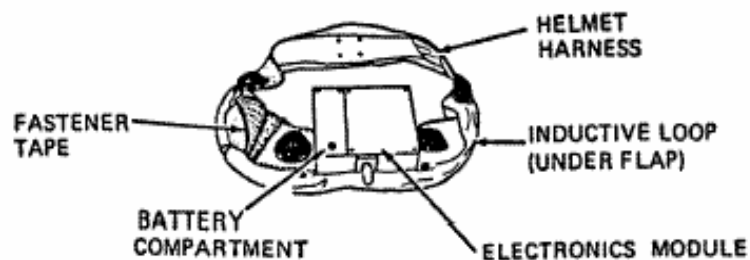


Figure 3-1. Helmet Harness Assembly

3.2.2 Torso Harness

Refer to Figure 3-2 for an illustrated view of the Torso Harness assembly which consists of the following major parts.

ELECTRONICS MODULE	contains the battery and all the components needed to operate the Torso Harness.
8 DETECTORS	receive the laser beam.
ALARM	sounds a tone when the MWLD is struck by a laser beam.
KEY RECEPTACLE	is the device which receives the WEAPON key. The yellow WEAPON key is inserted into the key receptacle to turn off the alarm.
INDUCTIVE LOOP	receives the helmet-generated KILL or NEAR MISS information.
4 HOOKS	allow the Torso Harness to be attached to the hip-worn web belt.

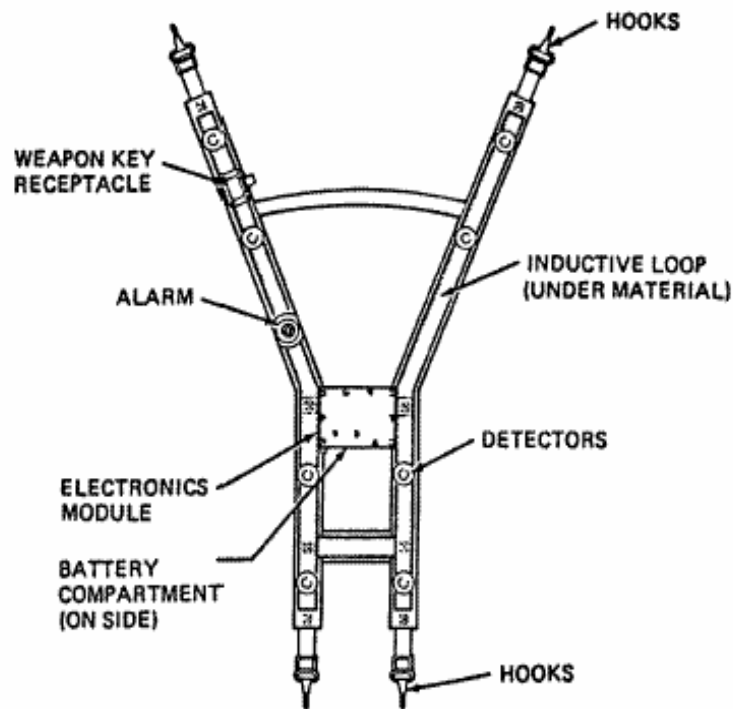


FIGURE 3-2. Torso Harness Assembly

3.3 LIMITATIONS OF EQUIPMENT

The following information pertains to the MWLD assembly:

1. Typically, each battery provides 100 hours of normal use.
2. MWLD assemblies use BA 3090/U, 9 volt alkaline batteries.
3. When the yellow WEAPON key is installed into the key receptacle, decoding is not disabled and when the key is removed, appropriate KILL alarms will sound until the system is reset.

3.4 INSPECTION AND CLEANING

This section explains the inspection and cleaning procedures for the:

- Helmet Harness
- Torso Harness

To inspect and clean the Helmet and Torso Harnesses:

1. On the Helmet Harness, wipe all 5 detectors clean with a cloth.
2. On the Torso Harness, wipe all 8 detectors clean with a cloth.
3. Inspect the Helmet and Torso Harnesses for damage which would prevent normal operation.

3.5 INSTALLATION

This section explains the attachment and installation procedures for the:

- Helmet Harness
- Torso Harness

3.5.1 Attaching the Helmet Harness

Refer to Figure 3-3 while performing these procedures.

Attach the Helmet Harness on the helmet using the following directions.

NOTE

Ensure that the chin strap of the helmet is hanging loose.

1. Locate the fastener tape on the harness and pull it apart.
2. Place the harness over the helmet with the electronic module positioned in the rear.
3. Ensure that the thick bottom edge of the harness containing the inductive loop completely overhangs the rim of the helmet.
4. Stick the fastener tape together so that the harness is securely attached to the helmet.
5. Place the helmet on your head and adjust the chin strap as necessary to ensure that the helmet is secure on your head.

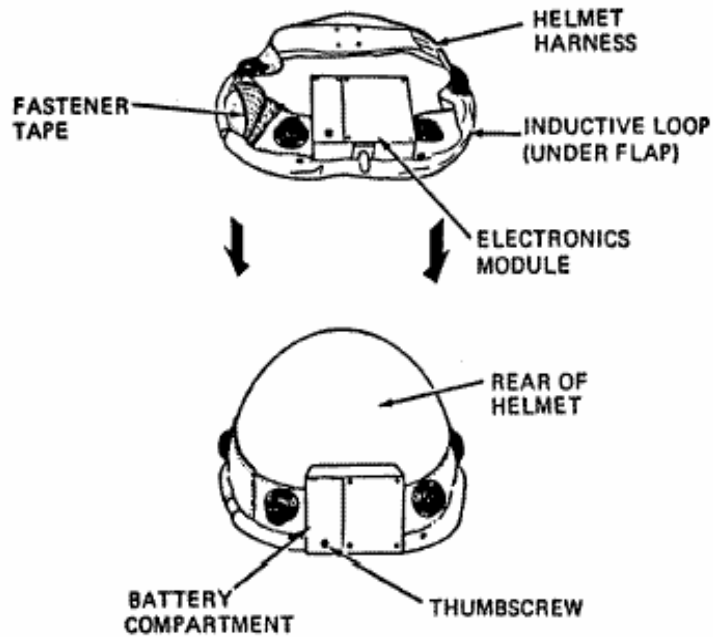


FIGURE 3-3. Attaching the Helmet Harness

3.5.2 Attaching the Torso Harness

1. Position the web belt next to the Torso Harness as shown in Figure 3-4 (the alarm should be positioned above the electronics module). If suspenders are attached to the web belt, remove them.

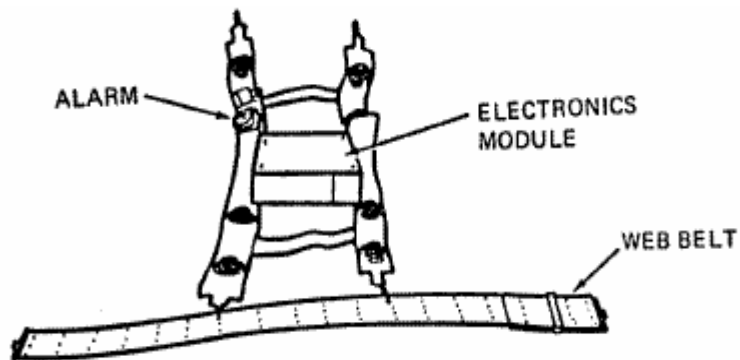


FIGURE 3-4. Attaching the Torso Harness to the Web Belt

2. Locate the securing clamp around each of the two hooks. On each of the hooks, push the pointed end of the clamp back with your thumb to reveal the exposed hook (refer to Figure 3-5). Connect the two hooks to the web belt. Secure the Torso Harness to the belt by pushing the securing clamp back over the hook.

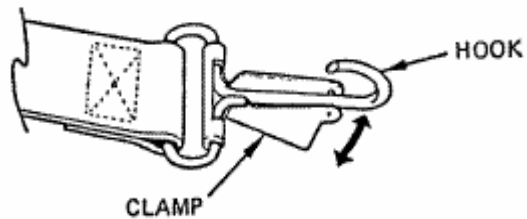


FIGURE 3-5. Securing Clamp

3. With the web belt positioned at your lower back (and not buckled to itself), raise the harness and lower it over your head (refer to Figure 3-6). Let the harness hang loose on your chest.

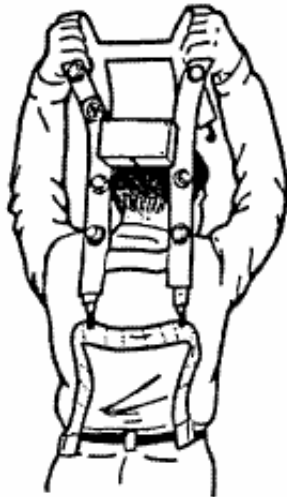


FIGURE 3-6. Torso Harness Placement

4. Fasten the web belt together using normal procedures.
5. Secure the remaining two hooks as in Step 2, on the front of the harness to the belt (refer to Figure 3-7).

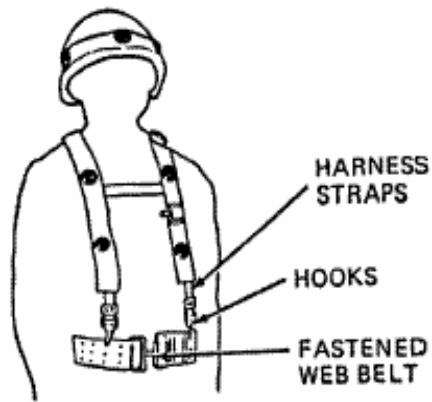


FIGURE 3-7. Torso Harness Attachment

6. Adjust the harness straps so that the electronics module is at the back of your collar line.

3.6 OPERATION

Operation of the MWLD assemblies consists of:

- installing batteries into the Helmet and Torso Harnesses
- testing the Helmet and Torso Harnesses and the total system
- identifying the modes of operation
- resetting the system

3.6.1 Helmet Harness Battery Installation

NOTE

The Helmet Harness battery should be installed prior to the Torso Harness battery.

To install the Helmet Harness battery, perform the following procedures (refer to Figures 3-1 and 3-8):

1. Locate the compartment marked BATTERY on the left side of the electronics module. Notice that the compartment door is secured by a captive thumbscrew.
2. Loosen the thumbscrew with your fingers and open the compartment door.
3. With the electrical contacts aligned as shown in Figure 3-8, securely place a 9 volt alkaline battery (type BA3090/U) into the compartment. Polarity of the contacts is required.
4. Close the battery compartment door and hand-tighten the thumbscrew.

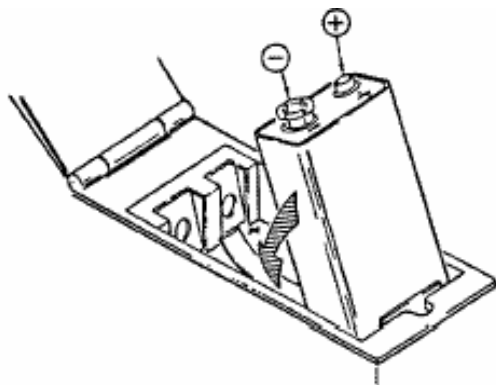


FIGURE 3-8. Helmet Harness Battery Installation

3.6.2 Torso Harness Battery Installation

NOTE

Before proceeding, ensure that the yellow WEAPON key is available.

To install the Torso Harness battery, perform the following procedures (refer to Figures 3-2 and 3-9):

1. Locate the battery compartment labeled BATTERY within the electronics module.
2. Loosen the thumbscrew and open the battery compartment door.
3. With the electrical contacts aligned as shown in Figure 3-9, put a 9 volt alkaline battery (type BA3090/U) in the battery compartment. Polarity of the contacts is required.

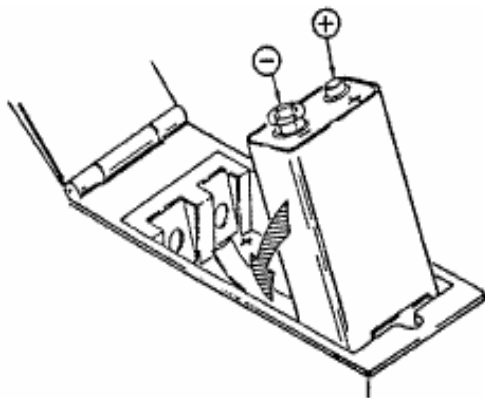


FIGURE 3-9. Torso Harness Battery Installation

NOTE

When the battery has been installed, the alarm will sound continuously. If the alarm does not sound try (1) reinstalling the battery or (2) inserting a new battery, or (3) replacing the harness. Tag defective items as appropriate.

4. Close the battery compartment door and hand-tighten the thumbscrew.
5. To turn off the alarm, insert the yellow WEAPON key in the Torso Harness key receptacle (refer to Figure 3-2) and turn it clockwise.
6. The MWLD system now needs to be reset as follows:

Remove the yellow WEAPON key from the Torso Harness key receptacle. Appropriate KILL alarm will sound. Have the Controller insert and turn the green key to silence the alarm and then remove the green key. The system is ready.

3.6.3 Testing the MWLD System By A Controller

Prior to operating the MWLD system, three items must be tested by the Controller. These items are the:

- Torso Harness
- Helmet Harness
- Total MWLD system

WARNING

Avoid viewing the laser emitter directly along the optical axis of the radiated beam.

3.6.3.1 Testing the Torso Harness

1. The Controller must test the Torso Harness with the Controller Gun set in the NEAR MISS mode.
2. As the Controller fires at each detector, the alarm should sound briefly with a pulsating tone, indicating a NEAR MISS.

NOTE

If no alarm sounds try (1) reinstalling the battery and testing again, or (2) replace the battery and test again. If there is still no alarm, replace the Torso Harness.

3.6.3.2 Testing the Helmet Harness

NOTE

The Helmet Harness and Torso Harness must be worn to be tested.

1. The Controller must test the Helmet Harness with the Controller Gun set in the NEAR MISS mode.
2. As the Controller fires at each detector, the alarm should sound briefly with a pulsating tone, indicating a NEAR MISS.

NOTE

If no alarm sounds (1) ensure that the bottom of the harness overhangs the entire rim of the helmet and test again, (2) remove and reinstall the battery and test again, or (3) replace the battery in the Helmet Harness and test again. If the alarm still does not sound, ask a soldier whose total MWLD assembly has already been checked and is operating properly to put on your helmet and test again. If the alarm does not sound, replace the Helmet Harness, however if the alarm sounds, replace the original Torso Harness. Tag defective items as appropriate.

3.6.3.3 Testing the Total MWLD System

1. The Controller must test the MWLD system with the Controller Gun set in the MAN KILL mode.
2. As the Controller fires at any one detector, the alarm should sound.
3. When the continuous tone sounds, the system may be reset as follows:
4. Have the Controller insert and turn the green key to silence the alarm and then remove the green key. The system is now reset.

3.6.4 Modes of Operation

Providing that all the equipment is installed as previously described in this manual and all precautionary measures have been followed, the Infantry System is now ready to be used.

The soldier who is hit by a laser beam falls under one of two states; he has either been KILLED or NEAR MISSED.

3.6.4.1 KILLED

When a soldier is KILLED by a laser beam, the alarm on the Torso Harness will sound continuously to indicate the KILLED state. The following actions are then necessary:

1. The KILLED soldier's yellow WEAPON key must be removed from the SAT located on the rifle and inserted into the key receptacle located on the Torso Harness.

NOTE: Once the yellow key has been removed from the SAT, the SAT becomes deactivated, thus disabling the soldier's ability to continue in the exercises.

2. Once the yellow key has been inserted into the receptacle on the Torso Harness, it must be rotated clockwise. This will silence the alarm.

NOTE: If the yellow key is removed from the Torso Harness, the alarm will once again continue to sound.

3. The KILLED MWLD system must now be reset by the Controller (see Section 3.6.5).

3.6.4.2 NEAR MISS

When a NEAR MISS laser beam strikes the soldier, the alarm sounds in short, pulsating tones to indicate the NEAR MISS. The soldier should take evasive action to ensure he is not KILLED.

3.6.5 Resetting the MWLD System

The MWLD system may be reset after being KILLED as follows:

1. Remove the yellow WEAPON key from the Torso Harness key receptacle and insert the Controller's green key.
2. Turn the green key to silence the alarm and then remove the green key.
3. The system is now ready.

3.7 HANDLING AND STORAGE

This section details the procedures used in the handling and storage of the MWLD.

Prior to placing the equipment in storage perform the following tasks:

1. Ensure all the equipment is clean and free from oil, dirt, or residue.
2. Inspect the equipment to ensure there are no defects or missing parts which would hinder normal operation.
3. If the equipment is wet, dry it.
4. If the equipment has failed or is in need of servicing, report this to the proper personnel.
5. Remove the Helmet and Torso Harness batteries to prevent leakage and corrosion.
6. Pack the equipment so that there is no likelihood of it being damaged.

2.7 ALIGNMENT USING THE SAAF

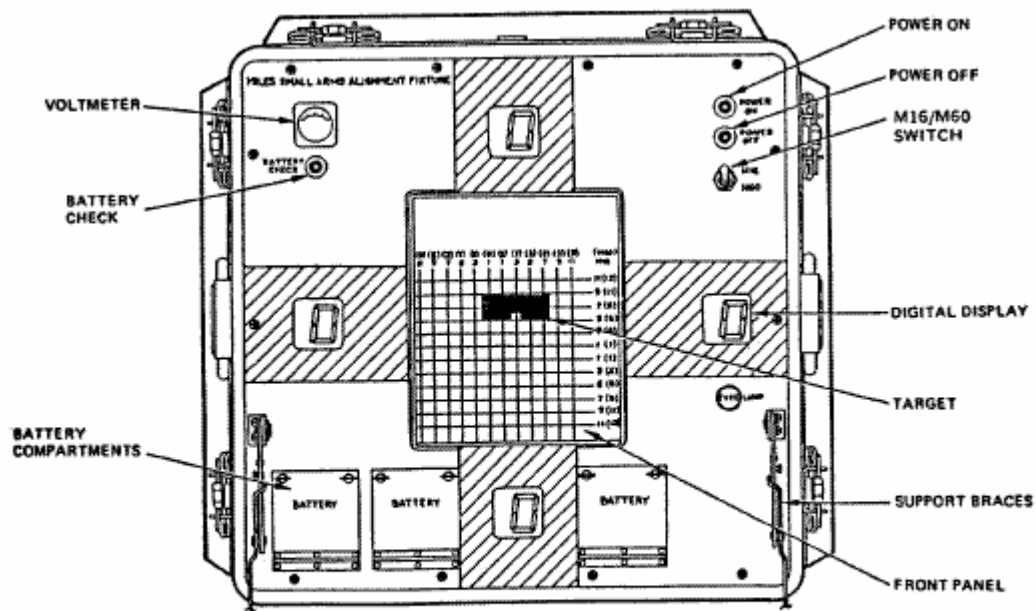
The following instructions pertain to boresighting the SAT using the Small Arms Alignment Fixture (SAAF).

NOTES:

- 1. Only adjust the SAT laser tube adjustors when performing the SAT boresight alignment procedure.**
- 2. Attach the SAT to the rifle in accordance with the installation instructions.**
- 3. The SAT can be aligned in either the BLANK-FIRE or DRY-FIRE mode.**
- 4. If using the BLANK-FIRE mode, ensure that the rifle is loaded with the proper blank ammunition.**
- 5. To use the DRY-FIRE mode, refer to the instructions in Section 2.6.2.**
- 6. The weapon sights of the rifle should already be set to your individual battle sight zero position.**
- 7. Do not adjust the weapon sights.**
- 8. Do not force the laser tube adjustors when making alignment corrections.**

To align the M16A1, M16A2, or SAW weapon sights with the SAT using the SAAF, perform the following procedures.

1. Set up the target at a range of 25 meters from the firing point.
2. Install three BA200 batteries into the SAAF.
3. Turn the POWER switch to the ON position.
- 4a. If using SAAF P/N 11835282 (refer to Figure 2-12): • set the M16/M60 switch to the M16 position for all SAT weapons: M16A1, M16A2, or SAW

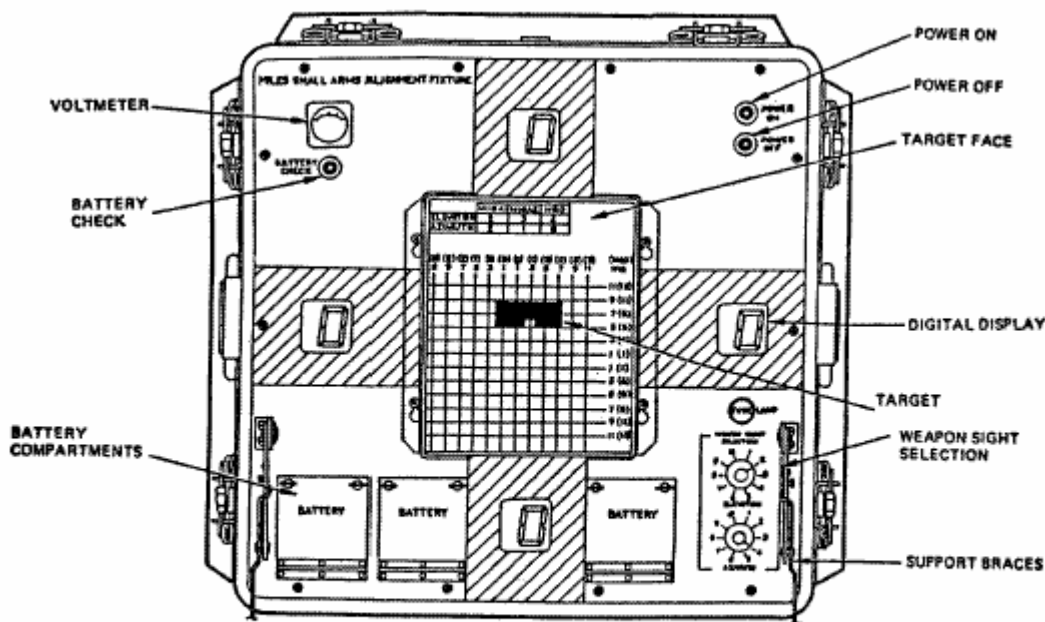


P/N 11835282

FIGURE 2-12. SAAF Front Panel

4b. If using SAAF P/N 9353020 (refer to Figure 2-13):

- set the WEAPON SIGHT SELECTION switches according to the elevation and azimuth information provided on the face plate for the M16A1 for all SAT weapons
- set the top switch (elevation) to 2
- set the bottom switch (azimuth) to 2



P/N 9353020

FIGURE 2-13. SAAF Front Panel

5. Assume the prone supported firing position.
6. Fire one round at the SAAF's sight alignment target.

NOTE

If no numbers are displayed on the SAAF after firing 2 or 3 rounds at the target, go to the Coarse Alignment Procedure (Section 2.7.1).

7. The SAAF displays will indicate the direction and number of 'clicks' you will be required to turn the laser tube adjusters to align the SAT's laser beam to the weapon sights of the rifle. Repeat firing until tolerance is achieved.

CAUTION

When using the laser tube adjusters, do not force them. If adjusters do not move freely, replace the SAT.

NOTE

The SAT laser tube adjusters are marked with 'click marks' (refer to Figure 2-14). Each mark represents 4 'clicks' and the 'clicks' represent the following:

- 1 'click' = 1 digit (SAAF)
- 1 full revolution = 36 clicks

Example:

On the SAAF, if the right display shows 8 and the lower (bottom) display shows 4, move the windage adjuster 8 'clicks' to the right (counterclockwise) and the elevation adjuster 4 'clicks' down (counterclockwise). When the SAAF displays four zeroes 0000 (+2), the SAT is aligned.

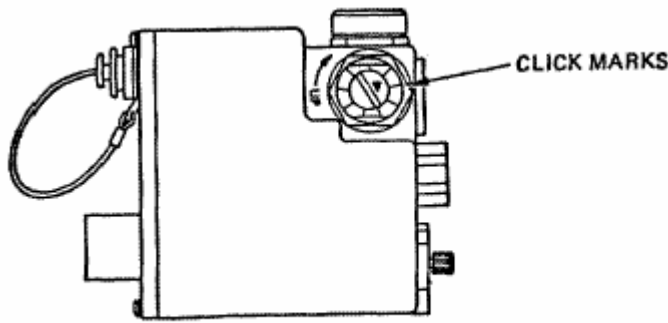


FIGURE 2-14. Laser Adjuster 'Click' Marks

Avoid viewing the laser emitter along the optical axis of the radiated beam.

To verify the alignment:

1. From a distance of 100 meters, fire at a soldier wearing a functional MWLD. The alarm on the MWLD should sound continuously indicating a KILL.
2. If the alarm does not sound or sounds only briefly (indicating a NEAR MISS) the SAT may not be properly aligned.

Realign using the SAAF.

NOTE

After completing SAT boresighting, do not move the SAT laser tube adjusters.

2.7.1 Coarse Alignment Procedure

1. Verify that the laser tube is approximately centered in the laser tube window. If not, position the laser tube in the center on the window by rotating the adjusters as required. To rotate the adjusters, a coin may be used.

CAUTION

Do not force the laser tube adjusters. If adjusters do not move freely, replace the SAT.

2. At a distance of 5 meters from the SAAF, assume the prone supported firing position.
3. Fire one round at the SAAF target face bull's-eye.

NOTE

If no display registers on the SAAF, perform Step 4a. If a display registers, perform Step 4b.

- 4a. No display appears, at close range, fire at another soldier who is wearing an operable MWLD. While firing, observe the FIRING indicator light. It should light when the SAT fires. If there is no MWLD alarm or no FIRING light appears, the SAT should be replaced.
- 4b. The SAAF does display correction indicators, adjust the SAT laser tube in the direction indicated by the SAAF, but multiply the indicated numbers by 5.

Example: The display indicators are 6 up and 9 right.

$6 \times 5 = 30$ and $9 \times 5 = 45$

Now your adjustments are 30 up and 45 right.

NOTE

The SAT laser tube adjustors are marked with 'click marks' (refer to Figure 2-14). Each mark represents 4 'clicks' and the 'clicks' represent the following:

5 'clicks' = 1 digit (SAAF)

1 full revolution = 36 clicks

5 Fire another round at the SAAF target face bull's-eye.

6. Make corrections as in Step 4b, if required.

7. Return to and perform Step 5 thru the end of Section 2.7.